User's Manual

HA12W

Hi-Gain™ 12dBi Directional Window Antenna

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INTRODUCTION

Package Contents

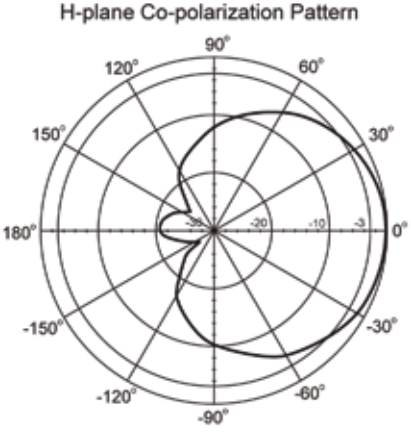
a. One Hi-Gain Window Antenna (HA12W)
b. Window/Wall Mounting Kit (two suction foots and four screws)
c. 4 ft. Antenna Cable
d. TNC Adaptor
e. User's Manual

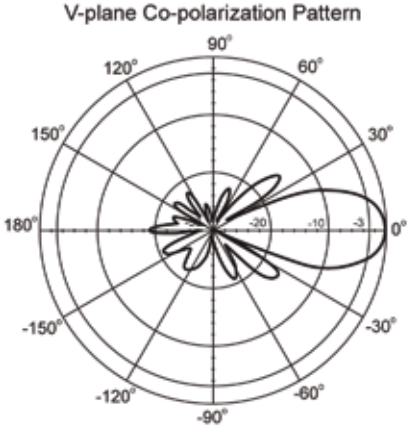
System Requirements

One Wireless 802.11 b/g Device with an external Antenna Connector

Coverage Area

These coverage diagrams show the



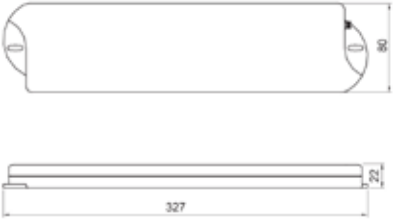


Electrical Specification

Frequency range	2400 - 2500 MHz
Gain	12 dBi
VSWR	2.0 : 1 Max.
Polarization	Linear, vertical
HPBW / horizontal	84°
HPBW / vertical	23°
Front to back ratio	15 dB
Downtilt	0°
Power handling	10 W (cw)
Impedance	50 Ohms
Connector	SMA female

Evironmental & Mechanical Characteristics

Survival wind speed	216 km/hr
Temperature	- 40° C to +80° C
Humidity	95% @ 55° C
Lightning protection	DC ground
Radome color	Ivory
Radome material	ABS, UV resistant
Weight	0.2 kg
Dimensions	327 x 80 x 22 mm



Installation

1. Remove the existing antenna from your Wireless Device or Wireless PCI Card on your Desktop Computer. Make sure the antenna connector on your wireless device is a **Reverse SMA Jack**.

   For Wireless brands that do not come with Reverse-SMA Jacks, the HA12W includes a TNC Connector Adapter*. Other type of adapters can be purchased directly from Hawking.

   *TNC connector usually works with most Linksys® and Cisco® Wireless Devices.

2. Locate the Antenna cable from the packaging and connect the side with the "Silver" colored connecter to the Window Antenna. Connect the side with the "Gold" colored connector to your Wireless Device.

   If the TNC Connector Adapter* is needed, attach it to the "Gold" colored connector on the Antenna cable, and then plug it into your Wireless Device. Make sure all the connectors are tight and secured.

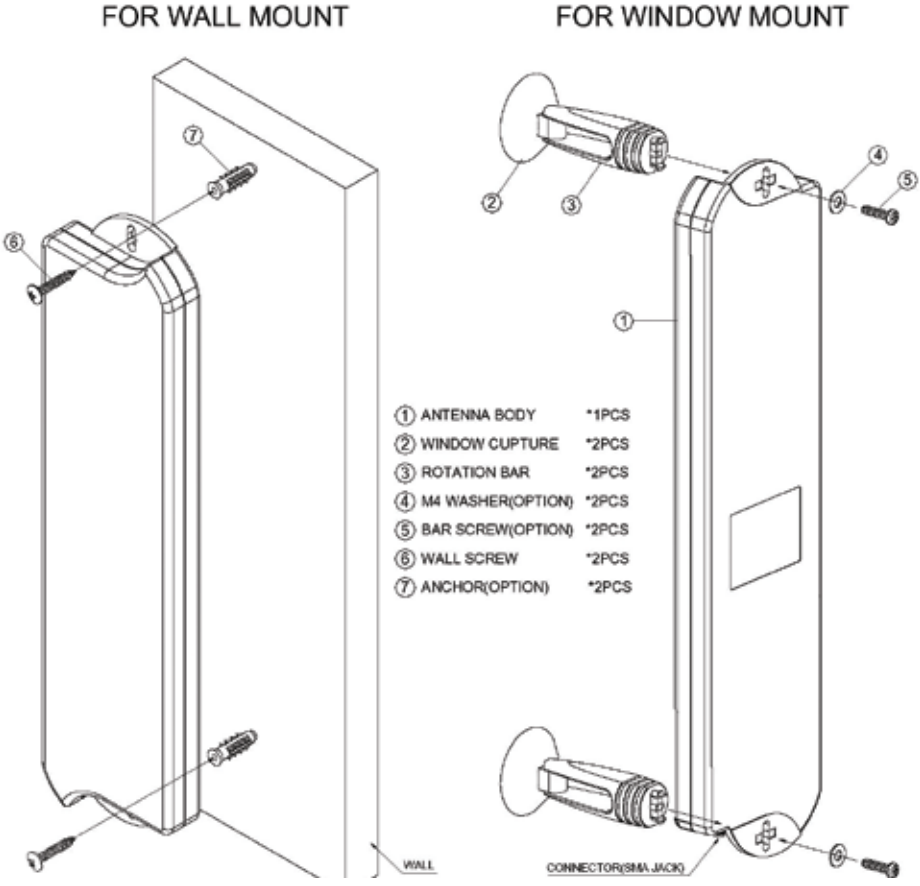
a. Remove the Antenna from your Wireless Device

b. Connect the "Silver" colored connector of the included cable to the Antenna

c. Connect the "Gold" colored connector to your Wireless Device

*TNC Connector Adapter

3. Mounting


FOR WALL MOUNT
FOR WINDOW MOUNT
① ANTENNA BODY *1PCS
② WINDOW CUPTURE *2PCS
③ ROTATION BAR *2PCS
④ M4 WASHER(OPTION) *2PCS
⑤ BAR SCREW(OPTION) *2PCS
⑥ WALL SCREW *2PCS
⑦ ANCHOR(OPTION) *2PCS
WALL
CONNECTOR(SMA JACK)

I. ANTENNA TERMINOLOGY

dBi (decibel): Used as a measurement unit for antenna strength. The standard factory antenna strength for 802.11b/g wireless products is 2dBi. A higher dBi level from the antenna signifies a more powerful wireless signal.

Omni-Directional Antenna: The antenna covers a 360° radius on plane level or a flat surface. It emits stronger signal in a slightly smaller angle (vertically) comparing to the Directional Antenna. The Omni-Directional is great for Wireless Access Points that serve multiple computers in different locations.

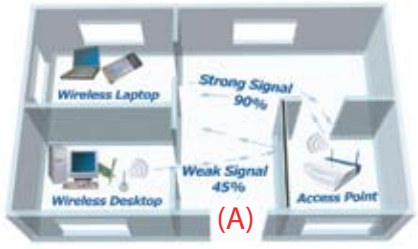
Directional Antenna: The Antenna emits a direct signal, approximately 80° angle on a flat surface , but wider coverage vertically. Directional Antenna are very effective on both Access Points and Network Adapters (such as, Wireless Bridges, PC Cards, USB Network Adapters etc...). Normally, it is reconmended to install two directional antennas to optimize the performance. The extended range may reach up to 2750 ft.

Reverse SMA Plug: Standard connector for a removable external Antenna. Most wireless Access Points and Routers come with detachable antennas. Reverse SMA plug is on the end of antenna connector that screws into the wireless device.

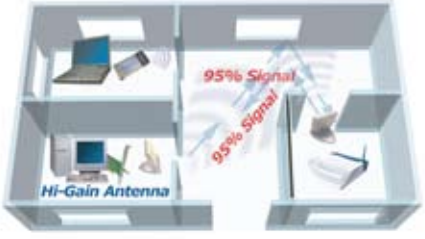
Reverse SMA Jack: Connector on the wireless device side (Access Point, Router, PCI Card) Reverse SMA Plug screws into the Reverse SMA Jack.

II. BASIC SETUP AND OPERATION

Below diagram is an example of a basic wireless Network.



Radio frequencies lose signficant signal strength when travelling through concrete and especially metal walls. Because of the wall in front of the Wireless Desktop room, the wireless signal is weak (A) and can not reach the room with a wireless desktop. To solve this problem a Hi-Gain Indoor Directional Antenna is set up to direct wireless signals out the door towards the opposite wall, then bounce the signal to the room with the desktop.



III. OBTAINING OPTIMAL ANTENNA PERFORMANCE

Obtaining one antenna or two antennas?

Depending on your wireless application, you may need two antennas, one on each end to optimize the signal. If you have an Access Point in a small environment, i.e. home, with multiple users in different locations, it is more cost effective for you to use one Omni-Directional Antenna. However, in areas that recieve poor coverage, you may need a Directional Antenna to amplify the signal from the receiving end, i.e. Client side.

For extended wireless range, it is reconmended that you use two Directional Antennas facing each other. If only one Hi-Gain Antenna applies to one end and a normal (manufacture standard) antenna on the other end, the result may not be as great as using two antennas. The Hi-Gain side may send out a signal quickly, however, the other end (manufacture standard side), may not have the strength to send back the signal instantaneoulsy.

Sever Side: HAI8DD connected to a Wireless Access Point

Client Side: HWU8DD connected to laptop or desktop

Client Side: HWU5DM connected to laptop or desktop

III. OBTAINING OPTIMAL ANTENNA PERFORMANCE (Con'd)

HA12W: Hi-Gain 12dBi Directional Window Antenna

To obtain optimal distances, the two antennas must be directly facing one another with little or no obstructions interfering with the signal (if possible a clear sight from one end to another.

NOTE: Many factors in the environment may affect your wireless range. Different wireless devices may have stronger signals than others which may derive varying performance results. For example, the wireless output power on Access Points may vary from one brand to the next, which would create different results. These published results were obtained using HAWKING TECHNOLOGY wireless devices that are tested to obtain the highest performances with HAWKING TECHNOLOGY Hi-Gain Antennas.

Caution: This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 1 foot during normal operation.

IV. REMOVING YOUR ORIGINAL ANTENNA

It is very easy to remove your original antenna. Simply, take your wireless device, whether it be an Access Point, Bridge, Wireless PCI Card, USB Adapter etc., and check to see if it has a removable antenna. To determine whether your original antenna is removable, examine the base of the antenna to see if it is a "screw on" type or a non-removable type.

Non-Removable

Removable

Do not try to force an antenna off. If you are not sure whether your antenna is removable, please contact the manufacturer or contact techsupport@hawkingtech.com.

To remove your original antenna, hold it by its base and unscrew firmly by turning it counter-clockwise until the antenna is seperated from the connector. After it has been removed, take your Hawking Hi-Gain Antenna connector and screw it (clockwise) onto your wireless device.

Unscrew Counter-Clockwise

Reverse SMA Plug

After you have firmly attached your Hi-Gain Antenna, place it in a location where it will achieve optimal performance.

V. CABLE LOSS

Cable loss is the loss in signal strength (dBi) due to the length of your antenna cable. Different types of Hi-Gain antenna cables have different rates of cable loss. However, in all cases, the longer your antenna cable is, the more signal strength (dBi) you will lose. This table lists the specific antenna model, its cable type and the amount of dBi lost per meter of cable:

HI-GAIN CABLE LOSS TABLE

MODEL	DESCRIPTIONS	CABLE TYPE	CABLE LOSS/ METER
HAI7SIP / HAI7SIA	7dBi Indoor Omni-Directional	RG316	2.5 dBi/m
HAI7MD	7dBi Indoor Directional	RG316	2.5 dBi/m
HAI8DD	8dBi Indoor Directional	RG316	2.5 dBi/m
HAO9SIP / HAO9SDP	9dBi Outdoor Omni & Directional	HDF400 (HAC30N)	0.26 dBi/m
HA12W	12dBi Window Antenna	ULA168	0.85~9 dBi/m
HAO14SIP / HAO14SDP	14dBi Outdoor Omni & Directional	HDF400 (HAC30N)	0.26 dBi/m
HACNT	N-Plug to TNC Jumper Cable	ULA198	0.82 dBi/m

As you can see from the chart, depending on the type of cable, there is a varying range of cable loss per meter.

Measuring exact dB loss due to cable: (3.28 ft = 1 meter) Conversion rate HAC30N is 30ft long. It has a cable loss of 0.26 dBi per meter.

Simple conversion shows that the use of this cable will result in:
30 ft (Cable length) / 3.28 (conversion rate) = 9.15 meters
9.15 meters x 0.26 (cable loss per meter) = 2.37 dBi

Therefore, when attached the HAC30N to an 9dBi Outdoor antenna, the actual signal strength will be 6.63 dBi (9.0 - 2.37 = 6.63)

Please be sure to check the amount of cable you need and use the shortest length possible to keep your signal strength at the highest level.

HI-GAIN RANGE EXTENDING PRODUCTS

INDOOR ANTENNAS

HAI7SIP
7dBi Omni-Directional Antenna

HAI15SC
15dBi Corner Antenna

HAI8DD
8dBi Directional Dish Antenna

HAI7MD
7dBi Directional Antenna

OUTDOOR ANTENNAS

HAO9SIP
9dBi Omni-Directional Antenna

HAO9SDP
9dBi Directional Antenna

HAO14SDP
14dBi Directional Antenna

SIGNAL BOOSTERS AND RANGE EXTENDERS

HSB2
Wifi Signal Booster

HWREG1
Wifi Range Extender

ACCESSORIES

HAC30N
30ft N-Plug Extension Cable

Extension Cables, Surge Protectors, and Connector Converters can be purchased to enhance your wireless network quality. Visit www.hawkingtech.com for more information.

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LIMITED WARRANTY

Hawking Technology guarantees that every Hi-Gain 2.4 Series Antenna and Accessory is free from physical defects in material and workmanship under normal use for one (1) year from the date of purchase. If the product proves defective during this one-year warranty period, call Hawking Customer Service in order to obtain a Return Authorization number. Warranty is for repair or replacement only. Hawking Technology does not issue any refunds. BE SURE TO HAVE YOUR PROOF OF PURCHASE. RETURN REQUESTS CAN NOT BE PROCESSED WITHOUT PROOF OF PURCHASE. When returning a product, mark the Return Authorization number clearly on the outside of the package and include your original proof of purchase. IN NO EVENT SHALL HAWKING TECHNOLOGY'S LIABILTY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE OR ITS DOCUMENTATION. Hawking Technology makes no warranty or representation, expressed, implied or statutory, with respect to its products or the contents or use of this documentation and all accompanying software, and specifically disclaims its quality, performance, merchantability, or fitness for any particular purpose. Hawking Technology reserves the right to revise or update its products, software, or documentation without obligation to notify any individual or entity. Please direct all inquiries to: techsupport@hawkingtech.com

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